

Appl. No. 10/523,168
Reply to Office Action of March 7, 2007

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A quartz crystal substrate used to form a twin in a quartz crystal by the hot pressing method, this quartz crystal substrate being characterized in that this substrate has, on one side, a step structure in which protruding parts that serve as pressure receiving surfaces for receiving the pressure of the pressing apparatus are formed, and this step structure is formed by a combination of a lithographic exposure technique and dry etching.

2. (Cancelled)

3. (Currently Amended) A pressing apparatus used to form a twin in a quartz crystal by the hot pressing method, this pressing apparatus being characterized in that the apparatus has heater

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blocks, and pressing members that are constructed from a different material from the material of these heater blocks are attached to these heater blocks; and

the portions of the surface of one of the pressing members that contact the portions of the quartz crystal that desirably undergo twinning, have a protruding shape that protrudes beyond the other portions.

4. (Cancelled)

5. (Currently Amended) The A pressing apparatus according to Claim 3, ~~used to form a twin in a quartz crystal by the hot pressing method, this pressing apparatus being which is~~ characterized in that the apparatus has a heating mechanism in the pressing blocks, and this heating mechanism has a plurality of heaters.

6. (Currently Amended) The A pressing apparatus according to Claim 3 ~~used to form a twin in a quartz crystal by the hot pressing method, this pressing apparatus being which is~~ characterized in that air pressure alone is used to generate the

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pressing force.

7. (New) The pressing apparatus according to Claim 3 which is characterized in that one of the pressing surfaces is held on the main body of the pressing apparatus via a switching mechanism.

8. (New) A method for producing a step structure on a surface of a quartz crystal, the method comprising steps of;

applying a lithographic exposure technique to the quartz, crystal; and

dry etching the quartz crystal.

9. (New) The method according to Claim 8, wherein the step of applying the lithographic exposure technique further includes the steps of;

forming a Cr film on the surface of the quartz crystal;

coating a resist on the Cr film and exposing a portion except, a predetermined portion; and

removing the exposed resist and Cr film to leave the Cr film and resist on the predetermined portion; and

wherein the step of dry-etching comprises dry-etching the

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surface using the Cr film and resist remaining on the
predetermined portion, as a mask.